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By _____ Printed: Carmen Pili Ekstrom

THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	
Leonel Yanez MARTINEZ et al.	
Serial No. 10/613,433	Group Art Unit: 2831
Filed: JULY 3, 2003	Examiner: William Mayo II
Title: **DRY WATER RESISTANT COAXIAL CABLE AND METHOD OF MANUFACTURE THEREOF**	**APPELLANTS' BRIEF UNDER 37 C.F.R. §41.37**
Docket No. MX/JFServ-001	

Assistant Commissioner for Patents
Washington D.C. 20231

REQUEST FOR *EN BANC* OR REVIEW BY AN ENLARGED BOARD OF APPEALS

Sir:

This is responsive to the Final Rejection dated August 5, 2010 in the above-identified application. Appellants have initiated a new Notice of Appeal and Appeal Brief in accordance with 37 CFR 41.31. Attached is the Appeal Brief pursuant to 37 C.F.R §41.37. Appellants request to reinstate any previously paid Appeal Brief fees. MPEP §1204.01; 37 CFR §41.20.

Appellants request that the Appeal Brief be reviewed *en banc* or by an enlarged Board of Appeals for the following reasons:

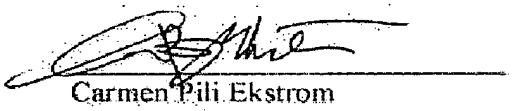
The present application was filed on July 3, 2003 and published on January 27, 2005 as US 2005-0016755 A1. The application has been undergoing examination for **more than 7 years**.

First, EP03254294.6 pending patent application which was filed on July 7, 2003, **issued on March 21, 2007, as EP 1457996** (attached). This information was conveyed to the Examiner

be affected if the proposed modification by the Examiner were incorporated. These modifications teach away from the presently claimed invention. Each of the arguments alone is sufficient to establish that a *prima facie* case of unpatentability has not been made. In combination, they present a compelling argument that the claims are patentable over the prior art. It is submitted that the Examiner has not presented sufficient arguments or reasoning to contradict the evidence provided by Appellants that the prior art fails to provide a suggestion for providing an improved dry water resistant coaxial cable and method of manufacture thereof with unexpected properties.

WHEREFORE, in light of the arguments and authorities presented above, reversal of the Examiner's action in rejecting claims 68-75 and allowance thereof are respectfully urged.

Respectfully submitted,



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on March 9, 2009. All of the cited prior art in the issued EP1457996 were all directed to **coaxial cables** for use in **communication cables** (Discussion below). None of the cited prior art by USPTO Examiner were directed to coaxial cable for use as communication cable. None of the prior art disclose or suggest coaxial cables.

On July 15, 2008, The Board of Appeals denied the Appellants' appeal and stated that the Examiner has established obviousness of Claims 11-27 and that the cited prior art by the Examiner, e.g., Chan, U.S. 5,486,648 clearly describes all of the limitation set forth in the claim including the adhesive in the first polymer layer and that Goehlich, U.S. 6,784,371 are merely cumulative to teachings in Chan et al. The Board stated that Claim 22 which recited external conductor thickness of at least 0.2 mm and diameter of 14.2 mm in the Appellants' application were taught by Belli, U.S. 6,455,769 and would involve only routine skill in the art. Board Decision, item 4 page 4 citing Examiner answer. (Appellants are addressing this issue below)

On September 18, 2008, the Appellants filed a new set of claims in the present patent application. The new set of claims have been **substantially narrowed** and recited the limitation **"consisting of." These claims are the same set of claims which were granted in Europe on March 21, 2007.**

The Examiner continued to reject the substantially narrowed new set of Appellants' claims over the same prior art, Chan, U.S. 5,486,648, Goehlich, U.S. 6,784,371 and Belli, U.S. 6,455,769. Again, Appellants appealed the rejection of the pending new set of claims with the limitation **"consisting of"** on November 11, 2009. The Examiner Answer issued on February 18, 2010. Appellants filed a Reply brief with a one month extension of time on June 7, 2010. The Reply Brief was not entered because extension of time was not allowed for filing Reply Briefs.

On June 1, 2010, Appellants Petitioned the Examiner's indefiniteness rejection and issuance of new prior art in Final rejection. A Supplementary Petition was filed on July 22, 2010 regarding indefiniteness issues and new prior art cited in Examiner Answer. The Petition was granted on August 16, 2010.

On August 5, 2010, the Examiner reopened the prosecution and issued a Final rejection. Appellants did not understand why the prosecution was reopened. Appellants are filing this Appeal without payment of fees. MPEP §1204.01; 37 CFR §41.20. In addition, any after final amendment or affidavit or other evidence, e.g. Reply Brief, which was **not entered before must be entered and considered on the merits.** MPEP§1207.04

This appeal involves a **dry, water resistant, coaxial cable for use in communication cable, e.g. cable TV for signal transmission.** In order to connect coaxial cables to transmission or reception equipment, it is necessary to prepare a coaxial cable and then seal the connectors to prevent water penetration. The problem is that due to poor sealing, inadequate cable installation results. Current methods to prevent water penetration use fillers and oil dispersed water insoluble materials and stabilizers based on glycol, ester acetate, ethylene glycol ester or ethylene glycol ester acetate.

The Appellants have developed a technique through a design of dry cable, i.e., without the use of filler, but incorporates the water penetration prevention element which permits to prepare and connect coaxial cable without using solvents and other cleaning elements.

Moreover, Appellants used low density polyethylene which is different and unobvious over the cited prior art by the Examiner which uses crosslinked polyethylene, as discussed below.

It is submitted that an understanding of the cited references by the Examiner and of Appellants' invention are essential to correct the resolution of the instant application.

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I. REAL PARTY IN INTEREST

The real party in interest in the appeal is the assignee, Servicios Condumex S.A. de C.V., pursuant to Assignment recorded in the United States Patent & Trademark Office on July 3, 2003 on Reel 013274, Frame 0172.

II. RELATED APPEALS AND INTERFERENCES

Based on information and belief, there are no such appeals or interference which will directly affect or be directly affected by, or have a bearing on the Board's decision in the pending appeal.

III. STATUS OF CLAIMS

Claims 68-75 are pending. Claims 68-77 were subjected to a restriction requirement. Appellants elected Claims 68-75, directed to coaxial cables, with traverse. Claims 76-77, directed to method claims and dependent on Claim 68, were withdrawn from consideration. Appellants request that Claims 76-77 be held in abeyance pending decision of the appeal. If product claims of Group I are allowed, Group II, directed to process claims and dependent from allowed product claims should be rejoined. MPEP 831.04.

Claims 68-75 stand rejected.

Claims 68-75 are appealed.

Claims 68-75 are listed in the attached Appendix.

IV. STATUS OF AMENDMENTS

Earlier amendments, claims 68-77 filed on March 9, 2009, all prior to the final rejection have been entered.

V. SUMMARY OF CLAIMED SUBJECT MATTER

In its broadest scope, Appellants' invention relates to a dry, water resistant coaxial cable **(10)** (Figs 1-2; page 3, lines 1-13; 20; page 5, lines 4-11) **consisting** of:

a metal core conductor element **(11)**; (Figs 1-2; page 3, lines 1-9; 21; page 5, lines 12-18)

a dielectric element around the core conductor based on three layers,

the first layer (12) (Figs 1-2; page 3, lines 1-9; 14-25; page 5, lines 19-25 to page 6, lines 1-6; page 8, lines 24-25 to page 9, lines 1-6) being applied onto the conductor as a uniformly thick film based on low density polyethylene mixed with a vinyl or acrylic adhesive (page 3, line 25 to page 4, lines 1-3; lines, 11-13; page 6, lines 3-5; page 8, lines 20-23; page 10, lines1-5), the second layer (13) (Figs 1-2; page 3, lines 1-9; page 6, lines 6-16; page 9, lines 14-20; page 10, lines 1-5) being based on an expanded polyethylene mix consisting of low density polyethylene or mixture of low, medium and high density polyethylenes (page 13, lines 12-14; lines 21-23) and a swelling agent selected from azodicarbonamide, p-toluene sulphonylhydrazide, or 5-phenyltetrazol, (page 4, lines 7-9; page 6, lines 14-16; page 9, lines 10-12) and optionally, a reinforcement layer (14) (Figs 1-2; page 3, lines 1-9; page 6, lines 16-25; page 9, lines 17-20) of the same characteristics as the first layer (12) (Figs 1-2; page 3, lines 1-9; page 13, lines 18-21); wherein it has a second external conductor element (15) (Figs 1-2, 4; page 3, lines 1-9; 14; page 4, lines 16-25; page 6, line 25 to page 7, lines 1-7; page 12, lines 3-7; page 14, lines 1-4) formed by a tape made of an aluminum or copper alloy or combined with other elements (page 4, lines 17-19; page 5, lines 13-15; page 10, lines 14-16) and surrounding said conductor consisting of a water penetration protective element (16) (Figs 1-2, 4; page 3, lines 1-9; page 7, lines 8-15; page 12, lines 3-7; 9-10; page 14, lines 6-7) keeping it dry and based on one or several swellable fibers or tapes formed by polyester threads or other swellable fibers (Figs. 1-4; page 3, lines 1-9; page 10, lines 17-21; page 12, lines 5-9); and the protective cover (17) (Figs 1-2, 4; page 3, lines1-9; 15; page 3, line 25 to page 4, lines 1-3; page 7, lines 16-25 to page 8, lines 1-3; page 12, lines 11-17) based on low, medium, high density polyethylene or a combination thereof (page 4, line 25 to page 5, lines 1-3).

Claim 69 The dry coaxial cable according to claim 68 wherein the core conductor is copper plated aluminum wire, with a uniform circular cross section of 3.15± 0.03 mm diameter. (Specification, page 13, lines 1-4; Figs.1-2).

Claim 70 The dry coaxial cable according to claim 68 wherein the adhesive component is chosen between ethylene acrylate acid or ethylene vinyl acid permitting better adherence and water resistance between the core conductor and the dielectric element. (Specification, page 3, lines 23-

25; page 4, lines 9-15; page 6, lines 3-12; 20-25)

Claim 71 The dry coaxial cable according to claim 68 wherein the second polyethylene film applied onto the core conductor shows better watertightness to the swellable dielectric improves its superficial appearance and offers a 13.0 ± 0.10 mm diameter. (Specification, page 13, lines 16-17; Figs. 1-2)

Claim 72 The dry coaxial cable according to claim 68 wherein the external conductor is formed by a tape made of aluminum or copper alloy or mixture thereof is formed in a cylindrical pipe and can be longitudinally welded, extruded or the edges can be overlapped and it has a thickness of 0.34 mm and the diameter on the pipe is 13.7 ± 0.10 mm diameter. (Specification, page 4, lines 16-20; page 14, lines 1-4; Figs. 1-2).

Claim 73 The dry coaxial cable according to claim 68 wherein the water penetration protective element consists of swellable tapes placed helically, annularly or longitudinally. (Specification, page 3, lines 15-19; page 4, lines 20-25; page 12, lines 4-9; Figs. 1-2).

Claim 74 The dry coaxial cable according to claim 73 wherein the moisture protection elements have an absorption speed of ≥ 15 ml/g per minute and their absorption capacity is over 30 ml/g. (Specification, page 14, lines 5-9; Figs. 1-2)

Claim 75 The dry coaxial cable according to claim 68 wherein the external cover is made of medium density polyethylene and has a diameter on cover of 15.5 mm ± 0.10 mm with a 0.67 mm ± 0.02 mm thickness. (Specification, page 14, lines 17-18; Figs. 1-2).

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VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

The issue on appeal are:

a) Whether or not Claims 71-72, 74 and 75 are properly rejected as being indefinite under 35 U.S.C. §112.

b) Whether or not Claims 68-75, directed to dry, water resistant coaxial cable were properly rejected as being unpatentable under 35 U.S.C. §103(a) over Chan et al. (U.S. 5,486,648) in view of Goehlich (U.S. 6,784,371) and further in view of Belli (U.S.6,455,769).

c) Whether or not each of Claim 68, 69, 70, 71 72, 73, 74 and 75 was properly rejected as being unpatentable under 35 U.S.C. §103(a) over Chan et al. (U.S. 5,486,648) in view of Goehlich (U.S. 6,784,371) and further in view of Belli (U.S.6,455,769).

VII ARGUMENT

A.The rejection of the claims under 35 U.S.C. §112 as being indefinite should be reversed because the specification disclosure shows the claim limitations are definite.

The claims do not stand or fall together. For purposes of 35 U.S.C. § 112, each of Claim 71, Claim 72, Claim 74, and Claim 75 stands apart from each other.

It is submitted that the "second polyethylene film" in Claim 71 is definite. In this regard, Claim 68 recited that the second polyethylene film as the reinforcement layer with same characteristics as the 1st layer. The specification provided that "the diameter of the third layer is similar to 1st layer with a 13.0±0.10 mm dia." See page 4, lines 14-16; page 6, lines 17-25; page 13, lines 15-24.

It is submitted that the "external conductor" in Claim 72 is definite. In this regard, Claim 72 recited the external conductor is formed by tape made of an aluminum or copper alloy or combined with other elements." The specification provided that "the external conductor has a thickness of 0.34 mm and 13.7±0.1 mm dia." See page 4, lines 17-20; page 6, line 25 to page 7, lines 1-8; page 14, lines 3-5.

It is submitted that the "moisture protection elements" in Claim 74 is definite. In this regard, Claim 74 recited the "moisture protection elements" have an absorption speed of > 15 ml/g per minute and their absorption capacity is over 30 ml/g. The specification provided that the water penetration protective element has an absorption speed is > 15 ml/g per minute and the absorption capacity is over 30

ml/g. Moreover, the specification provided that the water penetration protective element 16 is applied helically, annularly or longitudinally. See page 4, lines 22-24; page 7, lines 8-15; and page 14, lines 5-9.

It is submitted that the "external cover" in Claim 75 is definite. In this regard, Claim 75 recited the protective cover is based on low, medium, high density polyethylene or a combination thereof. The specification provided that the cover is 15.5 mm ±0.10 mm with 0.67 mm ±0.02 mm thickness. See page 4, lines 25 to page 5, lines 1-3; page 7, lines 16-25; and page 14, lines 17-18.

Applicants submit that claim indefiniteness is analyzed *"not in a vacuum,* but always in light of the teachings of the prior art and of the particular application disclosure as it would be interpreted by a person possessing the ordinary level of skill in the pertinent art (POSA);" the failure **to provide explicit antecedent basis for a term does not always render** the claim **indefinite.** *Energizer Holdings, Inc.* v. *TTC, 11* USPQ 2d 1625 (Fed. Cir.2006) quoting *In reMoore,* 169 USPQ 236 (CCPA 1971). A claim containing terms which are seemingly vague is not indefinite if it is **precise when read in the context of the specification.** *Charvat v. Comnr. Pats.,*182 USPQ 577 (1974).

MPEP states "Where a claim is refused for any reason relating to the merits thereof it should be "rejected" and the ground of rejection fully and clearly stated. See MPEP 707.07(d). Where Applicant traverses an objection, *the Examiner should if he repeats the rejection, take note of Applicants' arguments and answer the substance of it.* see MPEP 707.07(f). *Emphasis added.* It is important for the Examiner to communicate the basis of the rejection so that the issues can be identified early and Applicant can be given fair opportunity to reply. See MPEP 706.02(j). The goal of the examination is to clearly articulate any rejection early in the prosecution process so that the Applicant has the opportunity to provide evidence of a patentability and otherwise reply completely at the earliest opportunity. See MPEP 706.

Appellants submit that the Examiner has not established a *prima facie* case of indefiniteness under 35 U.S.C. §112 because there is literal support in the specification for the claims. The burden is on the Patent Office to establish *prima facie* case that the indefiniteness requirement has not been met. The Examiner has the initial burden of presenting reasons or evidence supporting his position that the skilled artisan would not recognize the claimed invention in the specification. *Ex parte Sorensen,* 3 USPQ 2nd 1462, 1463 (BPAI 1987) citing *In re Wertheim,* 541 F.2d 257 (CCPA 1976).

From the above, in light of the disclosure of the terms in the specification, it is submitted that the limitations are definite. Appellants request that the Examiner's objections be withdrawn.

35 U.S.C. §103

B. The rejection of the claims under 35 U.S.C. § 103 should be reversed because there are no references in the prior art that taken individually or together disclose all of the elements of the present invention, motivate or suggest the present invention, or provide a reasonable expectation of success.

The claims do not stand or fall together. For purposes of 35 U.S.C. §103, each of Claim 68, Claim 69, Claim 70, Claim 71, Claim 72, Claim 73, Claim 74, and Claim 75 stands apart from each other.

As an initial matter, Appellants arguments are as follows:

a) The present application has issued as EP1457996 on March 21, 2007. The claims of EP1457996 are similar to the present application. The cited prior by European Examiner were directed to coaxial cables for use in communication or signal cables. The U.S. Examiner cited prior art directed to power or electric cables. The prior art was **not** directed to coaxial cables either. Chan, U.S. 5,486,648, Goehlich, U.S. 6,784,371 and Belli, U.S. U.S. 6,455,769 are **all** directed to power cables. Power cables are different from communication cables.

b) The Examiner ignored the limitation of the claims of the present application, for example, "consisting", "coaxial cable", "low density polyethylene", "polyester threads", "diameter"

c) Chan, U.S. 5,486,648 taught away from the present invention.

d) There is no motivation or suggestion to combine Chan with Goehlich and arrive at the present invention.

e) There is no motivation or suggestion to combine Chan with Goehlich and Belli and arrive at the present invention.

I. The present application has issued as European Patent 1457996 on March 21, 2007. The claims of the issued EP1457996 are the same as the pending claims on appeal.

The present application has issued as European Patent 1457996 on March 21, 2007. The claims of the issued EP1457996 are the same as the pending claims on appeal. Moreover, all of the cited prior art in EP1457996 were directed to **coaxial cables for use in communication cables.**

For example, Murga et al., US2002088641 published on July 11, 2002 is directed to insulating structure for a **coaxial cable** for use as communication cable. It further discloses that the dielectric and mechanical characteristics of the coaxial cables are of great importance in order to assure optimum data transmission and to avoid losses or distortion of data, mainly due to variations of the insulation dielectric characteristics.

Carlson et al., US 6,201,189 issued on March 13, 2001 is directed to **coaxial drop cable** having a mechanically and electronically continuous outer conductor and an associated communications system.

Esker et al., US 5,949,018 issued on September 7, 1999 is directed to Water blocked shielded **coaxial cable**. It further discloses coaxial cables containing a water blocking material to prevent water migration. The most common method of protecting a cable against water penetration is the use of flooding materials to fill the interstices of the cable. Synthetic polymers and petroleum based greases and oils are commonly used as flooding materials.

Pope et al., US 5,796,042 issued on August 18, 1998 is directed to **Coaxial cable** having a composite metallic braid. It further discloses that Coaxial cables having a composite braid with a plurality of water expandable strands of yarn woven therein, preferably to quad coaxial cables having the inner metallic braid as the metallic composite braid.

In contrast to the cited prior art in the issued European patent, the USPTO Examiner cited prior art directed to power cables. None of the cited prior art employed coaxial cables. None of the cables of cited prior art by the USPTO Examiner was used in communication cables.

The cable of Chan is directed to **ground power and electrical cables**. The title of Chan is directed to POWER CABLE. The invention relates to electrical power cables which have concentric neutral wires (CNW). The specification is replete with disclosures directed to power cables. There is no disclosure or suggestion in Chan regarding coaxial cable for use as communication cable.

Goehlich is directed to **power cable**, copper telecom cable or fibre optical cable. The cable has a sensor used for detecting substance inside the cable. There is no disclosure or suggestion in Goehlich regarding coaxial cable for use as communication cable.

The title of Belli is directed to ELECTRICAL CABLES. The invention relates to

electrical cables for medium or high voltage power transmission. The medium voltage refers to voltage between 1kV and 30kV and high voltage refers to more than 30kV. There is no disclosure or suggestion in Belli regarding coaxial cable for use as communication cable.

Appellants submit that all of the cited prior art are directed to **power cables.** None of the above cited prior art was directed to coaxial cables of the present invention. Power cables are long, cylindrical symmetric structures with a dielectric which operates at relatively high electrical stress. See Chan et al., Background of Invention.

The present invention is directed to **coaxial cable** for use as communication cable, e.g., **cable TV** for signal transmission. Coaxial cable is used as a transmission line for radio frequency signals, in applications such as connecting radio transmitters and receivers with their antennas, computer network (Internet) connections, and distributing cable television signals. One advantage of coaxial cables over other types of transmission line is that the electromagnetic field carrying the signal exists only in the space between the inner and outer conductors. This allows coaxial cable runs to be installed next to metal objects such as gutters without the power losses that occur in other transmission lines, and provides protection of the signal from external electromagnetic interference. Coaxial cable differs from other shielded cable used for carrying lower frequency signals such as audio signals, in that the dimensions of the cable are controlled to produce a repeatable and predictable conductor spacing needed to function efficiently as a radio frequency transmission line.

The presently claimed invention is directed to **communication cables, i.e., cable TV** networks are designed taking into account the use of coaxial cables for signal transmission from the generation building to the subscribers. Said coaxial cables are classified in trunk, distribution and drop cables, and are usually made up of a core conductor, a dielectric insulation, and external conductor and a protective cover. See Appellants' Field of Invention paragraph 0002. Moreover, the cable can be used for trunk or **distribution cable in transmission networks for radio frequency signals, specifically for analog or digital television transmission signals** as well as energy signals for activating control peripheral equipment. It can also be used for Internet signal transmission, data transmission, cellular phone, etc. See Appellants' Description of Invention paragraph 0016.

Appellants submit that Chan does <u>not</u> disclose "**a coaxial cable**". The Final rejection

stated that Chan discloses a *dry water resistant* **coaxial cable** (Figs. 1-8). The Board of Appeals opinion dated July 15, 2008 also stated that Chan discloses a "coaxial cable" citing Examiner Answer. It is submitted that nowhere in the patent specification or claims of Chan does "coaxial cable" appears. Appellants submit that there is no disclosure or suggestion of "coaxial cable" in the cited prior art. This is a **mere characterization by the Examiner.**

It is submitted that the present invention is directed to a coaxial cable for use as a signal or communication cable. In contrast, Chan, Belli and Goehlich are directed to **power cables**. It is well known to one of ordinary skill in the art that communication or signal cables are *different and unobvious* over power cables in their properties, characteristics, function, utility and structure.

First, in *power cables*, the current is carried totally by the cross sectional area of the center conductor. The outer conductor is only for protection should the insulation fail. The center conductor carries the power and to make a complete circuit, the power cable needs the center conductor. In contrast, in *communication or signal cables*, the signal is carried by electric and magnetic fields in the dielectric material separating the inner and outer conductor. Signal or communication cable is for transmitting signal. In a signal or communication cable, the center conductor, outer conductor and the dielectric are involved in the signal transmission.

Second, *power cables* are not concerned with **surge impedance or commonly, characteristic impedance**. The characteristic impedance is related to capacitance and inductance per unit length of the cable. In power cables, the dielectric is purely for insulation and to keep the high voltage from collapsing. In contrast, **the characteristic impedance is critical in communication or signal cables.** Characteristic impedance is the effect on signals being transported. The impedance affects the characteristics of the signal or communication cable. If a cable is connected to an ideal pure resistor whose value is equal to its characteristic impedance, a signal transmitted toward the resistor will be entirely absorbed by the resistor and converted to heat. In other words, energy will be reflected up the cable. Otherwise, it generates reflectance characteristic problems and jumbles the signal. Characteristic impedance can be defined along any point on that transmission line as the ratio of a single pair of voltage and current waves at that point in the cable in the absence of all reflections.

Any RF transmission line, of which all coaxial cables and switches are a subset, has some

characteristic impedance that may or may not be constant over the length of that line. Characteristic impedance can be defined along any point on that transmission line as the ratio of a single pair of voltage and current waves at that point in the cable in the absence of all reflections. The frequency and the per unit resistance, conductance, capacitance, and inductance of a line determines the ratio of voltage and current, and will thus also define characteristic impedance, which is usually denoted Z_0.

Each type of coaxial cable has a *characteristic impedance* depending on its dimensions and materials used, which is the ratio of the voltage to the current in the cable. In order to prevent reflections at the destination end of the cable from causing standing waves, any equipment the cable is attached to must present an impedance equal to the characteristic impedance (called 'matching'). Thus the equipment "appears" electrically similar to a continuation of the cable, preventing reflections. Common values of characteristic impedance for coaxial cable are 50 and 75 ohms, as disclosed in the Appellants' specification.

For a coaxial cable, the characteristic impedance is given by the formula:

$$Zo = \sqrt{\frac{138}{\varepsilon}} \times \text{Log}_{10} \frac{D}{d} \text{ in ohms}$$

where "D" is the inner diameter of the outer conductor and "d" is the outer diameter of the inner conductor, respectively. ε is the dielectric constant.

As can be observed from this equation, the impedance is a function of the diameters. The conductor diameter can be very accurately controlled, but the dielectric diameter can vary based on the accuracy of the process. If the impedance changes are a consistent spacing of one 1/4 wavelength, this can cause *signifigant signal loss*.

The cable has to be dry to protect the characteristic impedance, which is important in signal transmission.

Third, *power cables* have not been used for a length of more than 50 miles long, while signal cables are used for 50 miles long for signal transmission. The signal cable, the ratio of diameter of the center and outer conductor determine the characteristic impedance.The breakdown of the dielectric in signal cable is not as important as in the power cable. Nothing in the signal cable is magnetic. However, in power cable, magnetic wires are used so when it is

pulled, it does not break.

Fourth, *power cables* usually have high voltage. In contrast, in a *signal or communication cable*, a single coaxial can provide the power itself. Signal or communication cables have minimum voltage and current. The outer conductor is continuous all the way around so the current can flow in any direction. The dielectric is intact, and carries the information.
In contrast, for power cables, if the dielectric gets wet, power deteriorates and voltage rating. Power cables have large conductor and large current.
high frequency

Chan, Belli or Goehlich did *not* realize the use of impedance in their *power cables*. In contrast, the characteristic impedance of the *coaxial cable* in the present application $1 \geq f \leq 1000$; f(MHz) is 75.00±.2.0 Ω. See Appellants' specification at page 17, line 5. Appellants have discussed in the specification that the dielectric consists of three layers. The first layer, the conductor, is a uniformly thick film made of low density polyethylene mixed with adhesive. Said layer links the conductor to the dielectric and acts as a moisture blocking element and minimizes the presence of air bubbles which contribute to the instability of the characteristic impedance and the structural return losses (SRL).

From the above, Appellants submit that coaxial cables for use in communication cables are different and unobvious from power cables because of their characteristics, properties, structure and utility.

II.The Examiner incorrectly interpreted Claim language

a. Coaxial cables

During patent examination, the patent claims must be "given their *broadest reasonable* interpretation consistent with the specification. *In re Hyatt*, 211 F.3d 1367 , 1372, 54 USPQ2d 1664 (Fed. Cir. 2000). See also MPEP §2111. During patent examination, the pending claims must be interpreted as broadly as their terms reasonably allow. When Applicant states the meaning that the claim terms are intended to have, the claims are examined with that meaning, in order to achieve a complete exploration of the applicant's invention and its relation to prior art. *In re Zletz*, 893 F.2d 319, 321; 13 USPQ 2d 1320, 1322 (Fed. Cir. 1985). See also MPEP §2111.01.

In several aspects of the Examiner's interpretation of the claimed subject matter of the present application, the disclosure in Appellants' specification and the problems in the coaxial cable prior art were *ignored* by the Examiner and defined unilaterally by the Examiner.

For example, the Examiner states in the Office Action dated August 5, 2010, page 5, item 6 as follows:

> "Chan discloses a dry, water resistant **coaxial cable** (Fig. 1-8), which provides improved protection against migration of water (Col.1, lines 5-16)..."

It is submitted that there is no disclosure or suggestion in Chan regarding **coaxial cables** for use in communication cables. Upon Appellants' review of Col. 1, lines 5-16 of Chan, US 5,486,648, the specification of Chan in fact discloses as follows:

> "This invention relates to **electrical power cables** which have concentric neutral wires (CN wires) applied helically over the cable... More particularly, the invention relates to improved protection against migration of water in **such power cables**.....

Next, the Examiner states, at page 16 of the Office action dated August 5, 2010, last paragraph as follows:

> "...Clearly, Belli also teaches a **power cable** having an external conductor (i.e. external shield layer) in the form of metallic foil layer, wherein overall purpose is to provide cable with protection from migration of water...."

As such, Appellants submit that the Examiner has *not* correctly and clearly interpreted the claims and its relation to the prior art. *In re Zletz*, 893 F.2d 319, 321; 13 USPQ 2d 1320, 1322 (Fed. Cir. 1985). See also MPEP §2111.01.

It is submitted that all of the cited prior art by the Examiner do not disclose or suggest **coaxial cables** for use as communication cables as claimed in the present invention.

b) TRANSITIONAL PHRASE "CONSISTING OF"

It is submitted that the Examiner incorrectly interpreted the claim language of the presently claimed invention by ignoring the fact that Appellants have amended the transitional phrase of Claim 68 to "*closed-ended*" language, "consisting of." The Examiner failed to consider all of the claim limitations in the Appellants' dry water resistant coaxial cable. It is submitted that these limitations are an objective indicia of **non-obviousness**.

MPEP §2111.03 provides that transitional phrase "consisting of" excludes any element, step, or ingredient *not* specified in the claim. *In re Gray*, 53 F.2d 520, 11 USPQ 255 (CCPA 1931); *Ex parte Davis*, 80 USPQ 448, 450 (Bd. App. 1948) ("consisting of" defined as "closing the claim to the inclusion of materials other than those recited except for impurities ordinarily associated therewith.").

The claims are explicitly limited in that no other component can be included in the coaxial cable. "Consisting of" is a term of patent convention meaning the claimed invention contains only what is expressly set forth in the claim. *Vehicular Techs Corp. v. Titan Wheel Int'l. Inc.*, 212 F.3d 1377, 1382-83 (Fed. Cir. 2000). "Consisting of" as used in the claims of the presently claimed invention limits the coaxial cable to claimed elements.

Broad claim 68 recites a dry, water resistant coaxial cable "**consisting of**": a metal core conductor element, a dielectric element around the core conductor based on three layers,

the *first layer* being applied onto the conductor as a uniformly thick film based on low density polyethylene mixed with a vinyl or acrylic *adhesive*,

the *second layer* being based on an expanded polyethylene mix consisting of low density polyethylene or mixture of low, medium and high density polyethylenes and a *swelling agent* selected from azodicarbonamide, p-toluene sulphonylhydrazide, or 5-phenyltetrazol, and

optionally a *reinforcement layer* of the same characteristics as the first layer; wherein it has a second external conductor element formed by a tape made of an aluminum or copper alloy or combined with other elements and surrounding said conductor **consisting of** a water penetration protective element keeping it dry and based on one or several swellable fibers or tapes formed by polyester threads or other swellable fibers; and the protective cover based on low, medium, high density polyethylene or a combination thereof.

Applying the above case laws to the present invention, it is submitted that the presently claimed invention is narrowed and limits the scope of the claims due to the transitional phrase "consisting of." It is submitted that the phrase "consisting of" *narrows* the scope of the presently claimed invention. The claims directed to dry coaxial cable and manufacturing method thereof are narrowed to the recited elements or embodiments (or steps) and nothing more.

Appellants submit that the introduction of other components or additional steps would materially change the characteristics or properties of the presently claimed invention. *In re De Lajarte*, 337 F.2d 870, 143 USPQ 256 (CCPA 1964). See also *Ex parte Hoffman*, 12 USPQ2d

1061,1063-64 (BPAI 1989).

In contrast, the term "comprising" is "open ended" or inclusive. In effect, comprising is a shorthand way of saying "including the following elements but not excluding others." For example, a claim to a combination comprising A + B covers a combination having A + B + C. The term "consisting of" is a closed term. Thus, a combination consisting of A + B does not cover the combination A + B + C. **A closed language excludes more than traces of other ingredients.**

Appellants have compared and identified the elements that are required in the presently claimed invention and the cited prior art.

The cited prior art Goehlich (U.S. 6.784,371) and Belli (U.S. 6,455,769) used transitional phrase "comprising" which are open ended and inclusive.

Similarly, Chan et al. (U.S. 5486648) employs the transitional phrase "*having*." Case laws have interpreted the term "having" as "open terminology, " allowing the inclusion of other components in addition to those recited;" *Crystal Semiconductor Corp.* v. *TriTech Microelectronics Int'l Inc.*, 246 F.3d 1336,1348, 57 USPQ2d 1953,1959 (Fed. Cir. 2001). Transitional phrases such as "having" must be interpreted in light of the specification to determine whether open or closed claim language is intended. See, e.g., *Lampi Corp. V.American Power Products Inc.*, 228 F.3d 1365, 1376, 56 USPQ2d 1445, 1453 (Fed. Cir. 2000). In light of the specification, it is submitted that Chan et al. intended the claims and disclosure to be open ended or inclusive, i.e., different variations, combinations and embodiments were intended.

Broad claim 1 of Chan et al. recite a cable "**having**" concentric neutral wires (CN) wires applied over a cable construction extending in a longitudinal direction to provide a metallic ground shield and having protective polymeric jacket over said concentric neutral wires characterized in that at least one continuous elongated water swellable element.

Appellants object to **Examiner's interpretation of Claim 68** on page 5 of the Office Action, stating, "[C]han discloses a dry, water resistant **coaxial cable** (Figs. 1-8)...with respect to claim 68, Chan discloses a cable (Fig.3) **consisting** of a metal core conductor element (1), a dielectric element (2-4) around conductor core (1) which is based on three layers, consisting of a first layer (2) being applied to the conductor (1) as an uniform layer (Col.5, lines 17-26 and being a material such as XLPE (i.e. low density polyethylene, col. 4, lines 19-25), a second layer (3) comprising cellular expansion polymer (i.e. XLPE) on first layer (2, Col. 5, lines 15-25) wherein cellular expansion polymer is a low dielectric coefficient polymer (i.e. XLPE), col. 5, lines 15-25) and a third layer (4) comprising a reinforcement layer on the second layer (3, Col.

15-25) wherein first layer and third layer (2 &4) may comprise a material such as (i.e. XLPE), low density polyethylene, Col. 4, lines 19-25) which have same characteristics (i.e. the first and third layer may be the same material XLPE), a second conductor (6) surrounding the dielectric element (4) consisting of a water penetration protective element (i.e. swellable tape, Col.6, lines 1-7) capable of keeping the cable dry (Col. 1,lines 5-16) wherein water penetration protective element (5d) may comprise plurality of swellable fibers (5 & 5d as shown in Fig 8) made of polyester fibers (Col. 3, lines 64-67) and a protective cover (7) made of low, medium or high density polyethylene (Col. 5, lines 37-40)."

There is no disclosure or suggestion regarding the transitional phrase "consisting of" in Chan. Similarly, this is another *mere characterization* by the Examiner.

Moreover, Chan discloses concentric neutral wires (CNW) which are non-continuous as discussed below. This element was not disclosed or suggested in the coaxial cable for use in communication cable of the present invention.

The claim of Belli (U.S. 6,455,769) recited an electrical cable "**comprising**": conductor (1); at least one insulating layer (3); outer metal shield (6) and a layer of expanded polymer material (5) placed under metal shield; characterized in that the layer of expanded polymer material is semiconductive and includes water swellable material wherein the expanded layer material has a degree of expansion between 5% and 500%.

Belli's Claim 2 recited a cable according to claim 1 wherein expanded layer has a **predetermined degree of expansion.**

The broad claim of Goehlich (U.S. 6.784,371) recited a cable "**comprising**" a cable core (1); an inner cable sheath (2); outer cable sheath (3); sensor (4) and a structured material between inner cable sheath and outer sheath arranged to allow any detectable substance entering between the inner cable sheath and outer cable sheath travel along the perimeter of inner cable sheath to reach sensor.

From the above, it is submitted that the Cha, Goehlich and Belli include other elements or structure which are not required in the components or elements in coaxial cable for use in communication cable of the present invention. It is submitted that the arrangement of the elements, the different layers, the specific element, the properties of the element, the utility and the field of endeavor by the coaxial cable for use in communication cable of the present invention are different and unobvious over the cited prior art.

The Examiner ignored the claim limitation "consisting of". As such, Appellants submit that the Examiner has *not* correctly and clearly interpreted the claims and its relation to the prior art. *In re Zletz*, 893 F.2d 319, 321; 13 USPQ 2d 1320, 1322 (Fed. Cir. 1985). See also MPEP §2111.01.

c) **XLPE or CROSS LINKED POLYETHLENE is not equivalent to low density polytheylene.**

For the semi-conductor shield layer (2) of Chan required polymeric compounds such as **crosslinked** polyolefin (XLPE),[1] ethylene propylene **rubber** (EPR) or ethylene vinyl acetate (EVA). Note col. 4, line 26 of Chan. In contrast, the ***structure*** of Appellants' cable required low density polyethylene (LDPE)[2] These materials are different in function and properties. It is submitted that crosslinked polyolefin (XLPE), EPR or EVA of Chan are not functionally equivalent to LDPE of the presently claimed invention.

As discussed in the Appellants' brief, XLPE or "cross-linked" polyethylene is **not equivalent** to low density polyethylene (LDPE) because they have different properties. XLPE is **crosslinked or cured**. See attached information on Cross-linked Polyethylene.

The Examiner alleged that XLPE and LDPE have the same density. Appellants submit that although the XLPE and LDPE may have the same density, they have great differences in electrical and thermal properties. The crosslinked polyethylene (XLPE) as disclosed in the prior art **required a cured process in order to obtain its heat resistance** and thus, have **high dielectric constant**. It is well known in the art that the dielectric constant is an **essential** piece of information when designing capacitors and in other circumstances where a material might be

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[1] XLPE a medium- to high-density polyethylene containing cross-link bonds introduced into the polymer structure, changing the thermoplastic into an elastomer. The high-temperature properties of the polymer are improved, its flow is reduced and its chemical resistance is enhanced. In polymer chemistry, when a synthetic polymer is said to be "crosslinked", it usually means that the entire bulk of the polymer has been exposed to the crosslinking method. See www.wikipedia.org/wiki/XLPE.

[2] LDPE is defined by a density range of 0.910-0.940 g/cm^3 LDPE has a high degree of short and long chain branching, which means that the chains do not pack into the crystal structure as well. It has, therefore, less strong intermolecular forces as the instantaneous-dipole induced-dipole attraction is less. This results in a lower tensile strength and increased ductility. LDPE is created by free radical polymerization. The high degree of branching with long chains gives molten LDPE unique and desirable flow properties. See www.wikipedia.org/wiki/LDPE

expected to introduce capacitance into a circuit. If a material with a **high dielectric constant** is placed in an electric field, the magnitude of that field will be measurably **reduced** within the volume of the dielectric.

In contrast, the low density polyethylene (LDPE) employed in the present invention has **no** thermal extended properties because they are **not cross linked** and **has a low dielectric constant** which provides **low capacitance for transmission properties**. It is submitted that XLPE is not equivalent to LDPE in their properties. XLPE can not be employed as insulation in a cable of the present invention that requires low capacitance.

	Thermal Properties	Electrical Properties	Use	Curing Process	Crosslinked
XLPE	Curing process requires heat resistance	High dielectric constant	Chan uses XLPE for power cable	Yes	Yes
LDPE	No thermal extended properties	Low dielectric constant; Provides low capacitance for transmission properties	The present invention uses LDPE for communication or signal cable	No	No

It is submitted that low dielectric properties are important in a signal or communication cable because of the high frequency. It is well known in the art that in a signal cable, the energy is in the form of electric and magnetic properties. For power cable, the dielectric characteristics are different from a communication cable as claimed in the present invention. The dielectric properties are less critical and can withstand DC voltage.

The Examiner argued that it is known in the art that polyethylenes have a density of between 0.91 and 0.94 are considered to be low density polyethylene and that XLPE has a density of 0.93 g/cc. Appellants submit that XLPE material employed in Chan may have the same density but they have great differences in electrical and thermal properties. The XLPE polyethylene requires a cured process to obtain its heat resistant and the dielectric constant is also high. The low density polyethylene (LDPE) employed in the present invention has no thermal extended properties because they are not cross linked and their dielectric constant are